Andrew Bain
Superfund Program
U.S. EPA, Region 9
75 Hawthorne St. (SFD-8-2) 9th Flr.
San Francisco, CA 94105

SUBJECT: U. S. NUCLERAR REGULATORY COMMISSION INTERAGENCY COMMENTS ON THE ENGINEERING EVALUATION COST ANALYSIS FOR THE NORTHEAST CHURCH ROCK MINE SITE, GALLUP, NEW MEXICO

Dear Mr. Bain:

The U.S. Nuclear Regulatory Commission (NRC) welcomes the opportunity to provide comments on the Engineering Evaluation/Cost Analysis – December 16, 2008, Draft Report for the Northeast Church Rock (NECR) Mine Site. Historically, the NECR Mine engaged in conventional strip mining of uranium ore which was processed at the adjoining United Nuclear Corporation (UNC) Church Rock Mill facility. Both facilities are owned and operated by the United Nuclear Corporation and listed as Superfund Sites. However, NECR mining operations and mine waste are outside of the NRC's jurisdiction because the operations and waste were not produced by processing ore for its source material content as envisioned under the Atomic Energy Act (AEA).

In the Engineering Evaluation/Cost Analysis, the U.S. Environmental Protection Agency (EPA) proposed five (5) potential actions for the final cleanup and disposal of mine waste from the NECR Mine Site. Please note that although the NECR mine waste and 'principal threat waste' as defined by the EPA may have similar radiological characteristics, the NRC regards these materials as "non-11e.(2) by-product material". In contrast, the tailings disposal cells at the UNC Church Rock Mill Site contain by-product material as defined by 11e.(2) of the Atomic Energy Act and thus these materials are subject to NRC's jurisdiction.

The majority of NRC's comments focus on three Alternatives (i.e. 3, 4, 5) and their respective sub-options to address the removal and disposal of soil contamination from NECR Mine Site to the UNC Church Rock Mill Site. The framework for NRC's comments regarding the co-disposal of NECR "non-11e.(2) by-product material" with by-product material at the UNC Church Rock Mill Site is addressed in the NRC Regulatory Issue Summary 2000-23 Recent Changes to Uranium Recovery Policy –November 2000 [Interim Guidance on Disposal of Non-Atomic Energy Act of 1954, Section 11e.(2) Byproduct Material in Tailings Impoundments"].

Based on our preliminary evaluation of these three Alternatives, the NRC considers co-disposal of NECR non-11e.(2) by-product materials within the licensed tailing disposal cells at the UNC Church Rock Mill Site as the most viable Alternative. NRC's rationale for favoring Alternative 5A is based on the fact that it avoids the unnecessary creation of an additional repository; it avoids to, a large degree, any additional long-term stewardship responsibilities beyond those currently envisioned at the NECR Mill Site, and, it is the Alternative most likely to achieve timely remediation of the mine wastes. Enclosed are NRC's more detailed comments on the Engineering Evaluation/Cost Analysis.

If you have any questions, please contact the project manager Yolande Norman at (301) 415-7741, or via E-mail at yolande.norman@nrc.gov. In accordance with 10 CFR 2.390 of the NRCs Rules of Practice, a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRCs Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

Sincerely,

Rebecca Tadesse, Branch Chief
Materials Decommissioning Branch
Decommissioning and Uranium Recovery
Licensing Directorate
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

Enclosure:
Comments on the Engineering
Evaluation/Cost Analysis

cc: See next page

If you have any questions, please contact the project manager Yolande Norman at (301) 415-7741, or via E-mail at yolande.norman@nrc.gov. In accordance with 10 CFR 2.390 of the NRCs Rules of Practice, a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRCs Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

Sincerely,

Rebecca Tadesse, Branch Chief
Materials Decommissioning Branch
Decommissioning and Uranium Recovery
Licensing Directorate
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

Enclosure:
Comments on the Engineering
Evaluation/Cost Analysis

cc: See next page

Distribution:
JWhitten W VonTill JHull KMcConnell

ML090500024

OFFICE	MDB/PM	DURLD/LA	OGC	MDB/BC
NAME	YNorman	SMichonski for CHolston	JHull	RTadesse
DATE	/ /2009	2/19/2009	/ /2009	/ /2009

OFFICIAL RECORD COPY

COMMENTS ON THE "ENGINEERING EVALUATION/COST ANALYSIS – DECEMBER 16, 2008, DRAFT REPORT FOR THE NORTHEAST CHURCH ROCK MINE SITE"

U.S. Nuclear Regulatory Commission's (NRC's) preliminary comments are divided into two (2) sections: 'General Comments' that provides an overview of the three Alternatives; and, 'Specific Comments' that clarifies some technical issues in the Engineering Evaluation/Cost Analysis (EE/CA).

NRC's General Comments

Please note that if either Alternative 3B, 4B or any of Alternative 5 sub-option(s) is selected by the U.S. Environmental Protection Agency (EPA), administratively, the NRC's Licensee would be required to submit a License Amendment (Docket No. 40-8907; License No. SUA-1475) to NRC for review and approval.

Alternative 3B: Removal of high-concentration ('principal threat waste') Northeast Church Rock Mine Site (NECR) material for containment in an existing tailings cell on the adjacent United Nuclear Corporation (UNC) Church Rock Mill Site. Under this scenario the remaining NECR mine waste that exceeded EPA's Action level but below the principal threat waste threshold would be consolidated and capped on-site at NECR: This approach would be contrary to 10 CFR Part40 Appendix A Criterion 2. The lower concentration material consolidated into newly constructed repositories at the NECR Mine site would be outside NRC's jurisdiction. Given that this portion of non-11e.(2) byproduct material would be capped at the NECR Mine Site, the EPA would be responsible for long-term custodial care of these on-site repositories.

If the principal threat waste (i.e. non-11e.(2) byproduct material) is consolidated within the existing tailings, the Licensee UNC would be required to submit a License Amendment that includes a revised Reclamation Plan and Financial Surety to be reviewed by NRC staff to determine if the proposed changes to features at the UNC Church Rock Mill Site (i.e. erosion protection, radon barrier, geotechnical stability of slopes) comply with 10 CFR Part 40 Appendix A and appropriate sections of NUREG -1620 Rev. 1 (NRC, 2003). If the revised Reclamation Plan is accepted and approved by the NRC, the Agency would assume jurisdiction for only the co-disposal of the NECR principal threat waste within the existing tailings disposal cells until the UNC Church Rock Mill Site is transferred under a general license to the U.S. Department of Energy (DOE) for long term custodial care**.**

Alternative 4B: Removal of high-concentration ('principal threat waste') NECR material for containment in an existing tailings cell on the adjacent UNC Church Rock Mill facility. Under this scenario the remaining NECR waste material that exceeded EPA's Action Level but below the EPA defined principal threat level would be consolidated and disposed in an aboveground, capped and lined repository that would be constructed on the NECR Mine: NRC's views on Alternative 4b are similar to Alternative 3b. If the above-ground repository is lined and capped to accommodate the non-11e.2 byproduct material on the NECR Mine Site, this would be outside NRC's jurisdiction. Under this scenario the EPA would be responsible for the long term custodial care for the operation and maintenance of any capped and lined repository(ies).

If the NECR principal threat waste which is considered to be non-licensed material is consolidated within the existing tailings cells at the UNC Church Rock Mill Site, the NRC does not recommend the placement of a liner to distinguish it from licensed by-product material from milling operations.

NRC's General Comments (cont)

See Specific Comments for NRC's discussions concerning liners being incorporated as part of the design for co-disposal within existing tailings disposal cells at the Licensed UNC Church Rock Mill Site.

Alternative 5: Removal of all NECR mine waste including 'principal threat waste' for disposal at the NRC Licensed UNC Church Rock Mill Site: This Alternative is further categorized into several approaches. Although two of these three approaches were not discretely identified in the EE/CA, based on interagency telephone discussions with the EPA, the NRC is providing comments on each of these sub-Alternatives.

5A: Consolidating NECR mine waste in existing tailings cells at the Licensed UNC Church Rock Mill Site: The NRC believes the implementation of Alternative 5a for the co-disposal of all the NECR non-11e.(2) by product material within existing tailings disposal cells at the UNC Church Mill Site is most likely to achieve timely remediation of the NECR mine waste. The framework for this approach is outlined in NRC's Regulatory Issue Summary 2000-23 which would allow for the existing tailing disposals to be re-designed in accordance with applicable sections of NUREG 1620 Rev. 1. Under this scenario NRC would assume jurisdiction for the NECR non-11e.(2) by product material until the decommissioning process is complete for the UNC Church Rock Mill and the site is transferred under a general license to DOE for long-term custodial care.

Based on inter-agency telephone discussions, the DOE favors Alternative 5A, provided that the NECR non-11e.(2) by product material is incorporated such that it is not distinguishable from the existing licensed by-product material already within tailing disposal cells at the UNC Church Rock Mill. DOE has expressed objections to the inclusion of a liner within the existing tailings disposal cells. The NRC understands that the Navajo Nation has also expressed support for Alternative 5A.

5B: Legally subdividing a clean portion of the UNC Church Rock Mill Site for the disposal of NECR mine waste: Currently there is insufficient data to support the determination of a clean portion of the UNC Church Rock Mill property for unrestricted release. Prior to submitting a License Amendment requesting such an action, the Licensee would be required to submit a proposal to NRC requesting approval to conduct supplemental field investigations outside the footprint of the tailings disposal area of the UNC Church Rock Mill Site. This proposal at a minimum would need to include, surface and subsurface soil samples; the collection of time-series groundwater sampling data; sampling data from building surfaces if appropriate; hydrogeologic parameters (e.g. water table elevations, groundwater flow, hydraulic conductivity, hydraulic gradients) from each of the underlying water bearing units (i.e. Southwest Alluvium, Upper Gallup Sandstone).

If the qualitative and quantitative assessment of the supplemental data supports unrestricted release in accordance with guidance in NUREG 1620 Rev. 1, the Licensee could submit a License Amendment request to seek release. However, this clean portion of the property would have to be administratively subdivided prior to NRC's approval for release. Once the property is administratively subdivided and meets NRC's criteria for release it would be excluded from UNC's License. Under this scenario, the EPA would assume long-term custodial care for any repositories containing NECR non-11e.(2) byproduct material.

NRC's General Comments (cont)

5C: Creating a new cell to accommodate all the NECR mine waste on the UNC Church Rock Mill Site.: Although technically the simplest approach to implement, administratively it would be the most challenging to determine jurisdictional oversight of non-11e.(2) by-product material in a lined cell located outside the existing by-product tailings disposal cells at UNC Church Rock Mill. Moreover, the DOE has already expressed objections in assuming long-term custodial care of NECR non-11e.(2) byproduct material if it is distinguishable from the licensed by-product material. Both the EPA and NRC agreed that this approach would pose significant administrative challenges thus this option would not likely to be pursued in the future.

NRC's Specific Comments

1. Please clarify the various roles of the participants in this action, including NRC's under Alternative 5; i.e., who selects the preferred alternative? Who designs the disposal under the selective alternative? Who pays the cost of the selected alternative? What is the regulatory authority delineation under Alternative 5?

2. Page 13; Section 2.1; 2nd paragraph: EPA indicates that under Alternatives 2-5 it will select a cleanup Action Level of 2.24 pCi/g. EPA should include justification for this selection in light of the fact that this level is considerably more conservative than EPA's own standards for soil cleanup at uranium recovery sites (5 pCi/g and 15 pCi/g depending on depth).

3. Page 17; Section 2.3.2.3; 2 nd paragraph: EPA states, "Regarding the remediation of mine wastes, Title I UMTRCA standards (Subpart A of 40 CFR 192(d)) offer the following guidance...". This paragraph goes on to cite the 200-1000 year stability period and the 20 pCi/m²/sec radon requirement provided in that regulation. The reference to "mine wastes" is incorrect and should be changed to "uranium milling wastes." In addition, discussion of 40 CFR 192 requirements should mention that that regulation includes criteria for soil cleanup as indicated in the aforementioned Site Specific Comment No, 2. Also, the UNC Church Rock Mill Site is a Title II UMTRCA site.

4. Page 18; Discussion of Erosion and Biointrusion: This section indicates that "…approximately 18 inches of rip rap will be placed over the soil sealing layer." At this early alternative analysis stage, it seems that there is no basis to be including even rough thickness projections for an erosion protection layer. It may be more appropriate to simply state that thicknesses of rock will be placed to provide adequate protection against erosive forces over the design stability period.

This section also indicates that, "Under Alternative 5 and Option B, the final design will need concurrence from the NRC." EPA should note that if any of the Alternatives (i.e. 3B, 4B, 5A-C) is selected, the final design for the tailings disposal cells at the UNC Church Rock Mill Site would require NRC's concurrence. Under any of the selected Alternatives, the cover design for co-disposal of NECR material with licensed by-product material would be completed through NRC's review and approval process by amendment of UNC's license.

NRC's Specific Comments (cont.)

Page 30; Section 3.6.1: This section presents a summary of Alternative 5, and indicates that after the NRC license is terminated, DOE will become the perpetual custodian. If in EPA's discussions with DOE, DOE has indicated any stipulations related to their acceptance of this co-disposal alternative, EPA should clarify DOE's position in this section.

6. Page 31; Section 3.6.3: The first paragraph in this section makes reference to "…the UNC NRC permit." The term permit (also used on page 53 in the last sentence of section 5.1.5.1) should be deleted and replaced with "license." Please delete all sections in the document that references the inclusion of a liner within the tailings disposal cells at the UNC Church Rock Mine site. Sections of the document should be revised, since it is high unlikely that a liner will be included as part of a final cap design approved by NRC and accepted by DOE.

7. Page 48; Section 4.7.1.3: The third sentence of this section refers to "…completion of the NRC license." This should be changed to "termination of the NRC license." In addition, this section indicates that the disposal design will minimize water infiltration and prohibit human or animal disturbance. This discussion should include that the design will reduce radon emanation to appropriate standards.

8. Page 49: Section 4.7.2.1: The last paragraph needs to include DOE as one of the stakeholders in the coordination effort.

9. Page 50; Section 4.7.3: The cost for Alternative 5 is presented as $40,207,870. Consider reducing this cost since, since it is highly unlikely that a liner within the existing tailings disposal cells would be approved by NRC and accepted by DOE.

10. Page 52; Section 5.1.4: The first sentence indicates that Alternatives 2 and 5 will reduce the volume, toxicity, and mobility. Encapsulation under these alternatives will likely reduce the toxicity and mobility of the wastes, but the volume will remain the same, just relocated.

11. Page 53; Section 5.1.5.2: The last sentence indicates that more community impact from off-site truck traffic will occur under Alternative 2 and Alternative 5. This is true; however it should be clarified this impact from Alternative 5 would be less than Alternative 2.

12. Page 54; Section 5.2.2: The 3rd bullet discusses a new repository on the UNC Mill site separate from the existing cells. Expanding on NRC's General Comments for Alternative 5B, further site characterization would be required to identify potential hazardous constituents in accordance with 10 CFR Part 40 Appendix A, and to assess the extent of contamination in surface soil (<15 cm depth), subsurface soil (>15 cm depth), and groundwater condition in each aquifer. Given that the EE/CA did not identify the exact location where a clean portion of the UNC Church Rock Mine Site would be legally carved out of the License, the following site

investigation/characterization is required to demonstrate if a portion of the site can be released from the existing UNC License.

NRC's Specific Comments (cont)

To date the hydrogeological data at the UNC Church Rock Mill Site have focused on the Southwest Alluvium aquifer, and the Upper Gallup Sandstone aquifer which includes Zone 1 to the east and Zone 3 to the northeast of the tailing disposal cells. Based on the limited geologic and hydrogeologic data on the northwest portion of the UNC Church Rock Mill Site, further site characterization will be necessary. During milling operations discharge to the tailings disposal cells artificially elevated the water table thereby creating a mounding effect that may have contributed to the radial flow of groundwater contaminants. In addition, the breach of the South Cell in 1979 caused the release of approximately 93 million gallons of tailings and pond water. Although clean up of the release was performed, it appears that no extensive investigation was conducted to determine the extent of groundwater contamination across the entire UNC Church Rock Mill Site.

Based on the site operational history, a sampling plan or survey should be designed to adequately investigate the horizontal, and vertical extent of contamination (area and depth for soil) and if necessary, soil background radioactivity for potential hazardous constituents. A sufficient number of groundwater monitoring wells screened in each aquifer is also be needed to determine; the hydrologic boundaries in the SW Alluvium and the zones within Upper Gallup Sandstone; groundwater flow condition in each aquifer, for example, water level elevations, general geochemistry, the spatial and vertical extent of groundwater contamination; and, flow and transport properties such as hydraulic conductivity and hydraulic gradients within each aquifer.

Generally one year of monitoring is required to adequately characterize the groundwater quality, consistent with the requirement of 10 CFR Part 40, Appendix A, Criterion 7. Groundwater samples are collected at least monthly. An acceptable statistical hypothesis testing method is used for establishing background water quality. Background water quality is required for each aquifer underlying the Church Rock Mill Site (e.g. Zone 3, Zone 1, and the SW Alluvial aquifer). The extent of contamination is defined in three dimensions through installation and sampling of monitoring wells installed at varied depths.

13. Page 56; last paragraph on Alternative 5: If a liner is not required under this alternative, the statement that "all construction elements were assumed to be the same as for Alternative 4" would not be accurate

14. Alternatives 1 – 5. EPA indicates that the approximate rock layer thickness for erosion protection purposes will be 18 inches for each of the alternatives discussed. Based on staff experience with sites in this area and in the UMTRCA program, it is likely that the rock thickness will not need to be 18 inches. Although it is not appropriate at this point to speculate on the final design details for the cover, diversion channels, and other erosion protection features, it is likely that an optimum design could result in a layer thickness of less than 18 inches and rock sizes less than 6 inches in many areas of the cell. Although larger rock sizes may be needed in channels and/or to protect diversion berms, much of the top slopes of the cells could be covered with smaller rock. These types of design changes could substantially reduce the costs of erosion protection for each of the alternatives and should be considered in the evaluations.

NRC's Specific Comments (cont)

15. Alternatives 1 – 5. EPA indicates that rock to be used for erosion protection is assumed to be available on-site or nearby. Based on staff experience with rock quarries in this area, it may be necessary to haul rock from as far away as about 75 miles. This was the case with the nearby Rio Algom Ambrosia Lake site, where competent rock was not available locally and rock was hauled from a quarry located near El Morro National Monument. Recent closures of nearby basalt quarries necessitated the use of this quarry. The non-availability of nearby rock could significantly increase the cost of erosion protection and should be factored into the analysis.

16. Alternative 5A. It should be noted that if alternative 5A is selected, it may be possible to re-use the rock, soil, and radon barrier that is currently present at the UNC Church Rock Mill Title II site. For example, if the current cover material at the site is excavated and the NECR material is placed in the excavated areas, it may be feasible to stockpile the excavated soil and rock and to re-use the material to cover the NECR wastes. Although detailed analyses of various design options and erosion protection requirements are needed, the potential cost savings associated with use of the existing rock should be factored into the costs for Alternative 5A.

17. Alternative 5A. It should be noted that the NRC staff is currently in the process of resolving some outstanding technical issues associated with sediment and erosion at the Church Rock site. If Alternative 5A is selected, it may represent an opportunity to resolve the issues, improve the Church Rock design, and to provide an excellent design for stabilization of the NECR wastes. It would be helpful if the EPA and NRC staffs could meet to discuss these issues and their possible resolution.

cc:

Mark D. Purcell
Superfund Division (6SF-LP)
U.S. EPA - Region 6
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

Thomas C. Pauling,
U.S. Department of Energy
Office of Legacy Management
2597 B ¾ Rd.
Grand Junction, CO 81503